



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,991	07/21/2006	Carin Vorde	P71362US0	9238
136	7590	10/01/2008	EXAMINER	
JACOBSON HOLMAN PLLC			CHAN, HENG M	
400 SEVENTH STREET N.W.				
SUITE 600			ART UNIT	PAPER NUMBER
WASHINGTON, DC 20004			4181	
			MAIL DATE	DELIVERY MODE
			10/01/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/586,991	VORDE ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	HENG M. CHAN	4181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-13 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-13 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>Oct.26 2007; Jul 19 2007</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### Status of Application

Claims 1-13 are pending and presented for examination on the merits. This application claims the priority date of PCT/SE05/00060 filed on January 21<sup>st</sup>, 2005.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,976,483 to Langlet et al., herein after Langlet I.**

Regarding claim 1, Langlet I discloses a method of preparing dinitramide salt, comprising:

- providing an initial compound, reacting said initial compound with a nitrating acid mixture to form dinitramidic acid in the reaction mixture,
- neutralizing said dinitramidic acid with a neutralizing agent to form the corresponding dinitramide salt and
- recovering said dinitramide salt (see column 1, lines 4-5, 9-14).

Langlet I teaches that the neutralizing agent can be made of a number of formulae, one of which is a salt **AX**, wherein **A** is a metal ion or a nitrogen-containing cation (see column 2, lines 45-46). **A** thus satisfies the requirement of being a positive ion added to

Art Unit: 1793

the reaction mixture. The neutralizing agent also forms an ion pair complex with dinitramidic acid as illustrated in the reaction formulae in column 2. The neutralizing agent, thus, can be considered equivalent to the positive ion. The dinitramide salts formed can be recovered by a plurality of techniques such as precipitation and elution through a column (see column 3, lines, 28-49).

Regarding claim 2, Langlet I discloses that when a salt **AX** is used as a neutralizing agent and **A** is a nitrogen-containing cation, it may consist of an ion of the formula ( $R''_kH_mN_m$ )<sup>+z</sup>...and R" is a straight or branched alkyl having 1-6 carbon atoms (see column 3, lines 8-11). **A** may also consist of a cubane or ring compound (see column 3, lines 17-22).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 3-6 and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patents 5,976,483 to Langlet et al. (herein after Langlet I) as applied to claims 1-2 above, and further in view of US Patent 6,291,711 to Langlet (herein after Langlet II).**

Art Unit: 1793

4. Regarding claims 3-6, Langlet I teaches that after nitration the neutralizing agent can be made of a number of formulae, one of which is a salt **AX**, wherein **A** is a metal ion or a nitrogen-containing cation (see column 2, lines 45-46) such as guanidium ( $\text{C}(\text{NH}_3)_3^+$ ) and triamino guanidinium ( $\text{C}(\text{NH}_3)_3^+$ ) (see column 3, lines 21-22).

5. Langlet I, however, does not specifically teach the use of guanylurea or guanylurea salt in forming a dinitramide salt.

6. Langlet II, however, also drawn to dinitramides discloses that guanylurea dinitramide can be made from a guanylurea salt (see example 1).

7. Therefore, in regards to claims 3, it would have been obvious to one of ordinary skill in the art at the time of invention to substitute nitrogen-containing cation such as guanidium ( $\text{C}(\text{NH}_3)_3^+$ ) and triamino guanidinium ( $\text{C}(\text{NH}_3)_3^+$ ) with protonated guanylurea and arrive at guanylurea dinitramide salt as taught in Langlet II, in the method of Langlet I, motivated by the fact that when the positive ion is added by guanylurea salt (as cited in claim 4) or guanylurea (as cited in claim 6) being reacted with the reaction mixture, it is a simple acid and base reaction in which the basic guanylurea is protonated by the acidic reaction environment and, thus, the positive ion is naturally formed in situ (as cited in claim 5).

8. Regarding claim 9, Langlet I teaches that a dinitramide salt, ADN, for example, can be prepared from another dinitramide salt like KDN (see column 4, lines 6) and Langlet II teaches that guanylurea dinitramide can be made from a guanylurea salt (see example 1). It would have been obvious to one of ordinary skill in the art at the time of invention to substitute a dinitramide salt with the separated precipitate (guanylurea

Art Unit: 1793

dinitramide) and arrive at a different dinitramide salt as taught in Langlet II, in the method of Langlet I, motivated by the fact that it is a simple ion exchange process.

9. Regarding claim 10-12, Langlet I teaches that a reaction mixture neutralized with KOH is worked up and 2-propanol is subsequently added to precipitate KDN and that KDN precipitates because of its low solubility in 2-propanol (see from column 3, line 66 to column 4, line 5). Since, it would have been obvious to one of ordinary skill in the art at time of invention to use KOH and an alcohol, as taught in Langlet I, in the transformation of guanylurea dinitramide to another dinitramide salt (KDN in this case).

10. **Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langlet I and Langlet II, as combined above, in further view of US Patent No. 4,559,409 to Seyerl.**

11. Langlet I and Langlet II both teach the making of dinitramide salts such as guanylurea dinitramide.

12. They do not specifically teach the use of cyanoguanidine.

13. Seyerl, however, states that it is known that reacting dicyanodiamide (cyanoguanidine) with sulfaminic acid in an aqueous or organic-aqueous medium forms the corresponding guanylurea salts at a temperature within the range of 70° C – 105 ° C (see abstract and column 1, lines 45-47). It would have been obvious to one of ordinary skill in the art at time of invention to use cyanoguanidine in an aqueous acidic reaction mixture to generate protonated guanylurea in situ and apply the making of guanylurea salt in situ to the making of the guanylurea dinitramide salt, motivated by the fact that the guanylurea salt produced from cyanoguanidine permits a much higher yield and

Art Unit: 1793

purity in terms of the same guanylurea salt by comparison with previous methods (see column 2, lines 33-37) and that the optimized level of guanylurea in the reaction mixture for making guanylurea dinitramide would help maximize the yield of the desired salt.

14. **Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Langlet I and Langlet II, as combined above, and further in view of US Patent No. 4,496,782 to Carr.**

15. Langlet I teaches a nitration process using a nitrating acid mixture such as nitric acid/sulphuric acid mixture (see column 1, lines 52-61), but does not teach the recovery or reuse of the spent acid.

16. Carr relates to a nitration process and discloses a method for recovering nitric acid from a spent acid stream from the nitration process (see column 1, lines 8-12). Carr recognizes that a substantial amount of nitric acid is typically lost in an economically and environmentally unsound manner in the spent acid of nitration (see column 1, 16-18). It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the method resulting from the combination of Langlet I and Langlet II with the step of spent acid recycling motivated by the fact that Carr teaches that the nitric acid in the spent acid phase is usually removed or recovered so that the remaining sulfuric acid can be reconcentrated and recycled to a nitration stage (see column 1, lines 22-25).

17. **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENG M. CHAN whose telephone number is (571)270-

5859. The examiner can normally be reached on Monday to Friday, 8:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry A Lorengo/  
Supervisory Patent Examiner, Art Unit 1793

HMC